

Amendment under 37 CFR § 1.111
Application No. 10/506,537
Attorney Docket No. 042541

REMARKS

Specification

The Abstract of the disclosure was objected to because the Abstract may exceed 150 words.

The Abstract, however, has **only 144 words**. Therefore, the objection is inappropriate and should be withdrawn.

Claim Objections

Claim 1 was objected to because of informalities.

Accordingly, claim 1 has been amended to overcome the objection.

Rejections under 35 USC §112, Second Paragraph

Claims 1-6 were rejected under 35 USC §112, second paragraph, as being indefinite.

Accordingly, the claims have been amended to overcome these rejections.

I. Regarding claims 1-4, the Examiner alleged that it was unclear what the relationship is between the claimed layer compositional and structural limitation with respect to the article prior to diffusion treatment and the article after diffusion treatment.

Claim 1 has been amended to “A heat-resistant Ni-alloy composite having excellent high-temperature oxidation resistance, comprising: a Ni-alloy substrate and a multi-layer surface structure comprising an inner layer with Cr content of more than 85% composed of an α -Cr

Amendment under 37 CFR § 1.111
Application No. 10/506,537
Attorney Docket No. 042541

phase and an outer layer composed of a β phase (Ni-Al-Cr) and a γ' phase ($Ni_3Al(Cr)$) on the substrate, wherein the Al content in the outer layer is at least 20 atomic percent.”

The Examiner asked (1) “Does the recitation of a layer in any of the claims always refer to an after diffusion treatment article?” and (2) “Must these layers be present both before and after diffusion treatment?”

Regarding question (1), although the claimed multi-layer surface structure is seen in the after diffusion treatment article in the embodiment described in the specification, the claimed heat-resistant Ni-alloy composite simply recites the multi-layer surface structure regardless of the diffusion treatment.

Regarding question (2), as already mentioned, the claimed multi-layer surface structure is seen in the after-diffusion-treatment article in the embodiment described in the specification. However, because claim 1 is directed to “a heat-resistant Ni-alloy composite,” it is irrelevant whether or not these layers be present both before and after diffusion treatment.

II. Regarding claim 1, the Examiner alleged that it was unclear whether the claimed “multi-layer surface structure” includes the Ni-alloy substrate and any layers.

As already mentioned, claim 1 has been amended to be clearly directed to “a heat-resistant Ni-alloy composite . . . comprising: a Ni-alloy substrate and a multi-layer surface structure . . .”

Amendment under 37 CFR § 1.111
Application No. 10/506,537
Attorney Docket No. 042541

III. Regarding claims 2-4, the Examiner alleged that it is unclear whether these described layers refer to layers that are present before diffusion treatment, after diffusion treatment, or both.

Claims 2 and 3 have been amended for clarification so that the claims clearly define the heat-resistant Ni-alloy composite, and claim 4 has been cancelled.

Rejections under 35 USC §102(b)

Claims 1-6 were rejected under 35 USC §102(b) as being anticipated by Rairden, III (U.S. Patent No. 3,998,603).

Rairden III discloses protective coatings for superalloys. Rairden III describes that the high Cr diffusion barrier (i.e., the alpha phase) appears as a relatively thin layer on the Ni-Cr alloy layer and a high aluminium layer covers the high Cr layer (column 7, lines 5-8). According to Fig. 3 of Rairden III, the high Cr diffusion barrier is a composition of **48-50% Cr, 45-46% Ni, and 3-5% Al**. The attached drawing (Fig. 1 of the present application) shows that the range of Rairden III is remote from the α -Cr area. This indicates that the composition of Rairden III is not of α -Cr phase.

In order to clearly distinguish from Rairden III, claim 1 has been amended to recite, among other things, “an inner layer with Cr content of more than 85% composed of an α -Cr phase.” This amendment is supported by Figs. 3 and 5 of the present application. The MPEP explains about changes to the scope of claims as follows:

Amendment under 37 CFR § 1.111
Application No. 10/506,537
Attorney Docket No. 042541

III. RANGE LIMITATIONS

With respect to changing numerical range limitations, the analysis must take into account which ranges one skilled in the art would consider inherently supported by the discussion in the original disclosure. In the decision in *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976), the ranges described in the original specification included a range of "25%-60%" and **specific examples of "36%" and "50%."** A corresponding new claim limitation to "at least 35%" did not meet the description requirement because the phrase "at least" had no upper limit and caused the claim to read literally on embodiments outside the "25% to 60%" range, however **a limitation to "between 35% and 60%" did meet the description requirement.**

(MPEP 2163.05).

Rairden III does not teach or suggest "an inner layer with Cr content more than 85% composed of an α -Cr phase."

For at least these reasons, claim 1, as amended, patentably distinguishes over Rairden III. Claims 2, 3, 5 and 6 directly or indirectly depending from claim 1, also patentably distinguish over Rairden III for at least the same reasons.

In view of the aforementioned amendments and accompanying remarks, Applicants submit that the claims, as herein amended, are in condition for allowance. Applicants request such action at an early date.

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney to arrange for an interview to expedite the disposition of this case.

Amendment under 37 CFR § 1.111
Application No. 10/506,537
Attorney Docket No. 042541

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

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Enclosure: Explanatory drawing

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Explanatory Drawing

